

HIGH CAPACITY SHEAR MECHANISM

BACKGROUND OF THE INVENTION

5                   CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Application No. 60/493,754, filed August 8, 2003, and which is incorporated herein by reference.

FIELD OF THE INVENTION

10                  This invention relates to railway drawbars and, more specifically, to shear mechanisms for railway drawbars.

DESCRIPTION OF RELATED ART

Prior art emergency release mechanisms, such as the shear bolts shown in U.S. patent 6,499,613 to Grau et al., are subject 15 to premature failure. These premature failures can be expensive to repair and can cause inconvenience.

Therefore, it can be appreciated that an emergency release mechanism which lessens the number of premature failures of emergency release mechanisms is desirable.

20                  BRIEF SUMMARY OF THE INVENTION

In one aspect the present invention generally provides an emergency release mechanism for a railway drawbar having a fastener stud, the fastener stud passing through an opening in a drawbar body, and a body of the fastener stud secured to a 25 release rail. A fastener is secured to one end of the fastener stud to hold the release rail proximate to the drawbar body.

In a further aspect of this invention a method of attaching a shear mechanism to a railroad drawbar includes securing a body of a stud to a release rail, passing the stud through an opening in a drawbar body, and securing a fastener to one end of the 5 stud to thereby draw together the release rail and the drawbar body such that they are proximate to each other.

#### OBJECTS OF THE INVENTION

It is, therefore, one of the primary objects of the present invention to provide an emergency release mechanism which 10 reduces the number of premature failures of emergency release mechanisms.

Another object, of the present invention, is to provide an emergency release mechanism which lessens the amount of fatigue in the emergency release mechanism during normal operation of 15 the drawbar.

#### DESCRIPTION OF THE DRAWING

The aforementioned and other features, characteristics, advantages, and the invention in general will be better understood from the following more detailed description taken in 20 conjunction with the accompanying drawing.

The sole FIGURE is a cross sectional view of an emergency release mechanism according to the present invention.

It will be appreciated that for purposes of clarity and where deemed appropriate, that the various elements in the drawings have not necessarily been drawn to scale in order to better show the features of the invention.

5                   DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Turning now to the drawing, the sole FIGURE shows an emergency release mechanism 10 together with a drawbar body 12 and a release rail 14 and are shown generally as 16. The emergency release mechanism 10, in the preferred embodiment, 10 consists of a fastener stud such as a two sided threaded stud 16, having a first threaded end 18, a cylindrical body 20 and a second threaded end 22, together with a fastener such as a lock nut 24, a through hole 26 in the drawbar body 12, a recess 28 having a machined surface 30 in the release rail 14, an aperture 15 such as a tapped opening such as a threaded hole 32 in the release rail 14, the rim of which is located in the recess 28, and a chamfered dowel extension 34 of the first threaded end 18 having a hole 36 there through. A retaining wire 38 passes through the hole 36.

20                  The dowel extension 34 is flattened such that a wrench interface is formed so that a wrench can be used on the dowel

extension 34 to screw the second threaded end 22 securely into the release rail 14.

Prior to the present invention the drawbar body and the release rail were held together by a two piece machine bolt 5 insert through the drawbar body into threads in the release rail. Because of manufacturing tolerances, the drawbar body and the release rail were not pulled tightly together at the site of the two piece machine bolt insert, but rather a space was present between the two piece machine bolt insert and the 10 release rail. This space caused a potential bending moment on the threaded portion of the two piece machine bolt insert of the mechanism during a buff (compressive loading) application to the drawbar. This bending moment could cause premature failures of the emergency release mechanism in the drawbar.

15 The emergency release mechanism 10 of the present invention eliminates this space in the sense that there is a solid contact between the release mechanism 10 and the release rail 14 via the stud 16 such that the drawbar body 12 and the release rail 14 are held proximate to each other. In the assembly of the 20 drawbar, in the preferred embodiment, the stud 16 is placed through the through hole 26 of the drawbar body 12 and is tightened into the threaded hole 32 in the recess 28 in the

release rail 14. The lock nut 24 is then attached and tightened to draw together the drawbar body 12 and the release rail 14 such that they are proximate each other. Any lateral or vertical forces applied to the drawbar body 12 with respect to 5 the release rail 14 are withstood mainly by the body 20 and the flat machined surface 30 of the recess 28 which is engageable with the surface 44 of the body 20. In the prior art emergency release mechanisms these forces were withstood solely by the threaded portion of the two piece machine bolt insert which 10 produced fatigue in the two piece machine bolt insert.

With the space eliminated, the bending moment on the threaded portion of the two piece machine bolt insert of the prior art mechanism during a buff application to the drawbar is no longer present. This improvement lowers the bending stress 15 and adds increased fatigue life to the emergency release mechanism 10 and reduces the rate of premature failure.

The width of the recess 28 is made wide enough so that it doesn't interfere with the shearing of the stud 16. That is, the maximum width of the body 12 of the two sided threaded stud 20 16 is less than the maximum width of the recess 28. Also, in the preferred embodiment, the two sided threaded stud 16 is manufactured by forming a one sided or single threaded stud

consisting of the body 16 and the first threaded end 18, then forming threads 40 in the end of the stud 16 opposite the threaded end and screwing into the threads 40 a threaded bar 42 to form the two sided threaded stud 16.

5 A cutout 46 in the center of a portion of the second threaded end 22 is formed for regulating the amount of shear force that the second threaded end 22 can withstand before it shears.

Testing of the emergency release mechanism 10 has shown  
10 considerable improvement in the fatigue life of the mechanism 10 without changing the required intent of the shear capabilities for an emergency release mechanism.

Although the invention has been described in part by making detailed reference to a certain specific embodiment, such detail  
15 is intended to be, and will be understood to be, instructional rather than restrictive. It will be appreciated by those skilled in the art that many variations may be made on the structure and mode of operation without departing from the spirit and scope of the invention as disclosed in the teachings  
20 contained herein.